

**DRAFT RESPONSES TO COMMENTS
FROM EPA AND CDPHE**

ON

**FINAL REVISION 2
TECHNICAL MEMORANDUM NO. 1
DEVELOPMENT OF
CORRECTIVE/REMEDIAL ACTION
OBJECTIVES FOR OPERABLE UNIT NO. 2**

**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
JANUARY 1995**

**U.S. DEPARTMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
GOLDEN, CO**

APRIL 1995

ENVIRONMENTAL PROTECTION AGENCY

General Comments

Comment 1: In addition to the enclosed comments, EPA would like to direct your attention to an issue regarding the distinct roles of the baseline risk assessment and applicable or relevant and appropriate requirements (ARARs) in determining clean up goals. The National Contingency Plan (NCP) preamble contains a discussion on ARARs and the baseline risk assessment: "To the degree possible, EPA makes use of chemical-specific ARARs in determining remediation goals for Superfund sites. However, because these standards are established on a national or statewide basis, they may not adequately consider the site-specific contamination or the cumulative effect of the presence of multiple chemicals or multiple exposure pathways and therefore, are not the sole determinant of protectiveness.

The selected remediation targets for Operable Unit No. 2 (OU2) rely almost exclusively on ARARs which, in some cases, represent a 10^{-4} risk level, the upper end of the acceptable risk range. This strategy may prove not to be sufficiently protective when cumulative effects of multiple chemicals are considered. Therefore, the DOE must re-examine the selected remediation targets when the baseline risk assessment for OU2 has been completed and approved by EPA as lead agency. Rocky Flats-specific current and future exposures will be better understood at that time. DOE must demonstrate that the selected remediation targets are protective or must revise them appropriately.

Response: The DOE recognizes the distinct roles of the baseline risk assessment and ARARs in the CERCLA/RCRA remediation process. It is understood that the selected remediation targets for OU2 are preliminary and were established to allow the CMS/FS to proceed with development of potential remedial alternatives. The OU2 remediation targets were never intended to be final remediation goals. The remediation targets will be reviewed and modified in the feasibility study, as appropriate, and will incorporate pertinent information from the baseline risk assessment, including the cumulative effects of multiple chemicals and exposure pathways.

In general, ARAR/TBC values were selected as remediation targets over calculated risk-based PRGs when the PRGs were less than the corresponding ARAR/TBC. The decision to use the ARAR/TBC values was based on a number of factors, including the wide regulatory acceptance of the ARAR/TBC standards for the remediation of CERCLA sites. In addition to risk-based factors, technical feasibility, analytical detection limits, and cost-effectiveness are also normally considered in the establishment of chemical-specific ARARs/TBCs.

Because of these factors, it was determined that chemical-specific ARARs/TBCs were appropriate remediation targets for the development and screening of remedial alternatives. Conversely, the majority of the risk-based PRGs calculated for the residential domestic use of groundwater are less than their corresponding minimum analytical detection limits and, therefore, were not considered to be appropriate. In these cases, the chemical-specific ARAR, which is typically consistent with the minimum detection limit, was selected as the remediation target.

Since the risk-based PRGs were conservatively calculated at a 10^{-6} level, it is anticipated that the cumulative effects from exposure to multiple chemicals and pathways will be within the acceptable CERCLA risk range of 10^{-4} to 10^{-6} even with the utilization of ARAR/TBC values. Furthermore, DOE should be allowed to utilize chemical-specific ARARs/TBCs to establish remediation targets and final cleanup standards to the same extent that is being allowed at other CERCLA sites.

Specific Comments

Comment 1: Page 4-1, Section 4.0, Development of Corrective/Remedial Action Objectives: The second, third, and fifth bullets state that preventing exposures to contaminated surface and subsurface soils and groundwater are remedial action objectives. This suggests that only institutional controls will be considered for these media. Consideration of institutional controls alone does not meet the requirements of a CERCLA feasibility study. Remedial alternatives in which treatment to reduce the toxicity, mobility, or volume of contaminants as a principal element is a requirement of the feasibility study (55 Federal Register 8848, March 8, 1990). Although in discussions with EPA and CDPHE, DOE gave assurances that other remedial alternatives would be considered, we believe the text should be modified to clarify DOE's intent. The phrase beginning with "prevent exposure..." should be replaced with "remediate contaminated surface soils that would result in a total excess cancer risk greater than 10^{-4} to 10^{-6} or a hazard index of greater than one for noncarcinogens to acceptable risk-based concentrations considering the reasonable maximum exposure scenario." A similar C/RAO should be included for both subsurface soil and groundwater.

Response: It has always been the intent of the DOE to include other general response actions, such as removal, *in situ* and *ex situ* treatment, and other remedies within the scope of the feasibility study for OU2. The phrase "prevent exposure to" is not intended to suggest that only institutional controls will be considered for these media. Therefore, this phrase will be replaced by the word "remediate" for the C/RAOs presented in Technical Memorandum No. 2, titled "Initial Screening of Remedial Technologies and Identification of Remedial Alternatives for Operable Unit No. 2" (TM-2).

Comment 2: Page 4-1, Section 4.0, Development of Corrective/Remedial Action Objectives: The C/RAOs don't completely address protection of groundwater. Please add the C/RAO, "Remediate subsurface soils to levels which will ensure protection of groundwater to levels prescribed by ARARs/TBCs considering site-specific subsurface soil/groundwater interactions."

Response: An additional C/RAO that states, "Remediate subsurface soils to levels which will ensure protection of groundwater as prescribed by ARARs/TBCs identified for groundwater considering site-specific subsurface soil/groundwater interactions" will be incorporated into the TM-2 and the CMS/FS report. PRGs for subsurface soils will be reduced to reflect the more aggressive remediation required to attempt to achieve this goal.

Comment 3: Page 5-4, Section 5.0, Other Readily Available Information: Unless DOE can provide sufficient information to demonstrate that the other Colorado sites chosen for comparison of cleanup standards are similar to the Rocky Flats situation, this information should not be used in choosing C/RAOs for OU2. Without sufficient site-specific information, it is difficult to determine whether cleanup standards for other sites can be considered protective of public health and the environment at Rocky Flats.

Response: The ROD information from other sites was not used in choosing C/RAOs or selecting remediation targets for OU2. The DOE acknowledges that cleanup standards are often site-specific and may be influenced by many factors. However, the intent of including cleanup standards at other sites was to provide comparisons with the selected ARARs which are consistently applied at remediation sites.

Comment 4: Table 5-2, Table, 5-3, and Table 5-4: Future use options for Rocky Flats also include recreational/open space use which will likely involve more intensive exposure than the ecological researcher scenario and the commercial/industrial scenario. We understand that this scenario is currently under development. When finalized, DOE should reevaluate the selected remediation targets for OU2 to ensure that they are protective of receptors in a recreational scenario.

Response: The selected remediation targets will be incorporated upon approval of the risk-based PRGs calculated using the recreational/open space scenario.

Comment 5: Include the rationale for why chromium is considered to exist in the trivalent form in OU2 and not the hexavalent form. Trivalent chromium is noncarcinogenic, hexavalent chromium is carcinogenic. The cleanup levels for these two species are very different.

Response: On Page 2-6, first paragraph, the last sentence states, "None of the samples [surface soil] analyzed as a part of the RFI/RI have indicated the presence of hexavalent chromium, even where chromium-bearing wastewater may have been disposed." This same issue was previously raised by CDPHE and adequately addressed by DOE. (Reference: Responses to Comments from CDPHE and EPA on Technical Memorandum No. 9, Chemicals of Concern (Draft Final), August 1994, for Operable Unit No. 2). Presented below is a portion of DOE's previous response.

There is speciation data available with respect to the valence states of chromium found in OU2. Twelve surface soil samples in OU2 were analyzed for total chromium and for Cr+6. Six analyses for Cr+6 were usable; the other six were R-qualified (rejected) because of exceedence of holding times. Cr+6 was a nondetect in all samples. The data indicate that Cr+6 does not occur in elevated concentrations in OU2 surface soils. Because both total Cr and Cr+6 results are well below the RBC screening level, further evaluation of Cr+6 was determined not to be warranted.

Comment 6: Page 5-16, third paragraph: DOE Order 5400.5 specifies that 4 mrem effective dose equivalent is the annual dose limit from drinking water exposure. The 4 mrem dose limit also represents approximately a 10^{-6} risk level, the point of departure for CERCLA remediation goals. DOE identifies the annual limit for drinking water as 100 mrem in Technical Memorandum No. 1 for OU2. The text and Table 5-4 should be changed to reflect the correct annual dose limit of 4 mrem to ensure compliance with both DOE Order 5400.5 and National Contingency Plan requirements.

Response: *This comment will be addressed in a forthcoming letter from DOE to EPA and CDPHE.*

Comment 7: Pages 5-13 through 5-16, Section 5.3, Groundwater: There are two issues concerning groundwater ARARs and TBCs which are being discussed by DOE, EPA, and CDPHE in the course of identifying sitewide ARARs. The issues are, the consideration of the State of Colorado RFETS site-specific groundwater standards and use classifications, and whether NRC standards and regulations apply to DOE sites. Until resolution is reached on a sitewide basis, the Colorado site-specific standards and

use classification for RFETS and the NRC standards should be considered potential ARARs for OU2.

Response: *This comment will be addressed in a forthcoming letter from DOE to EPA and CDPHE.*

Comment 8: Appendix A: The exposure factors used to calculate the RME and CT PRGs must be consistent with the recent agreements reached between DOE, EPA, and CDPHE on the Exposure Scenarios Technical Memorandum for OU2. The occupational exposure duration and the residential inhalation rates are incorrect.

Response: The risk-based PRGs, revised to reflect recently agreed upon exposure factors, will be presented in TM-2.

Comment 9: Page B-2, Appendix B: Please check and correct the slope factors for Uranium-238 plus daughter products and 1,1-Dichloroethene.

Response: The contaminant-specific toxicity information used to calculate PRGs was approved in the DOE's 1994 document entitled *Programmatic Risk Based PRG Document*. The contaminant-specific factors have since been updated (HEAST Supplement No. 2, November 1994). The Baseline Risk Assessment (BRA) is using current slope factors and when the BRA is incorporated into the OU2 CMS/FS, the most recently approved contaminant-specific toxicity information (at that time) will be used.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

General Comments

Comment 1: In this document, each PRG is calculated as if it were the only chemical present so that PRGs are not protective for exposure to more than one chemical. Corrective/Remedial Action Objectives must take exposure to multiple contaminants into account.

Response: The C/RAOs were developed to be contaminant- and media-specific (see Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA). The selected remediation targets were established to allow the CMS/FS to proceed with development of potential remedial alternatives, and were never intended to be final remediation goals. During the Detailed Analysis of Alternatives (DAA), the baseline risk assessment will be incorporated, and the remediation targets will be revised as appropriate.

Comment 2: Dermal exposure is not taken into account in the baseline risk assessment. The only place it will be assessed is in the CDPHE conservative screen. Dermal exposure to PCBs and PAHs can provide a significant amount of exposure and PRGs underestimate the risk due to exposure to these chemicals.

Response: Assessment of dermal exposure is included within the scope of the baseline risk assessment for OU2. As discussed earlier, the PRGs will be reviewed and revised, as necessary, once the baseline risk assessment has been completed. The risk-based PRGs presented in Technical Memorandum No. 1 were calculated using the exposure pathways presented in the DOE's 1994 document entitled *Programmatic Risk-Based Preliminary Remediation Goals*. The purpose of establishing programmatic exposure pathways was to standardize risk-based PRGs across all OUs (see page 4 of the programmatic goals document).

Comment 3: ARARs should not be preferentially selected over risk-based PRGs as final remediation goals. For carcinogens, the remediation goals, including those set at the chemical-specific ARAR level, must provide protection within the risk range of 10^{-4} to 10^{-6} (see Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, p. 4-15).

Response: The DOE agrees that ARARs should not be preferentially selected over risk-based PRGs if they are determined not to be sufficiently protective of human health and the environment. See the response to EPA General Comment 1.

Specific Comments

Comment 1: Section 5.1.2: By selecting a soil cleanup target (25 ppm PCBs by weight) that is appropriate for restricted areas, the assumption must be made that the current restrictions will remain in place forever. This assumption would require that institutional controls be established within OU2.

Response: The remediation targets for PCBs are tied to land use or access restrictions. Nonrestricted access areas would be remediated to 10 ppm and restricted access areas would be remediated to 25 ppm. Whether the remediation target is based on restricted or nonrestricted access, the maximum concentration of PCBs at OU2 is well below both regulatory standards.

Comment 2: Appendix A: The exposure factors in these tables must agree with the latest version agreed to by the parties.

Response: The risk-based PRGs, revised to reflect recently agreed upon exposure factors, will be presented in TM-2.